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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,026	10/10/2003	Michiko Takushima	50212-542	8006

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EXAMINER
JUBA JR, JOHN

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/682,026	**Applicant(s)** TAKUSHIMA ET AL.	
	Examiner John Juba, Jr.	**Art Unit** 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-6* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *10 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All b)☐ Some * c)☐ None of:
        1.☒ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date *10/10/2003*.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The abstract of the disclosure is objected to because:

> It is too lengthy. WORD™ counted 178 words. Abstracts are now limited to 150 words.
>
> Such claim terminology such as "means" should be avoided.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is confusing or incorrect in reciting that the wavelength branching means includes a plurality of mirrors. As disclosed (*e.g.,* at Pg. 7, lines 12-13), it is the reflecting means that comprises a plurality of mirrors.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Lefevre (U.S. Patent number 6,337,940). Referring *for example* to the discussion of Figure 7, and its further description in Lefevre's claims 1 and 2, Lefèvre discloses an optical element comprising

optical input/output means (104) having a plurality of ports (103) (112)[Col. 2, lines 65 – 67; Col. 5, lines 25 – 42];

polarization separating means (120);

polarization plane rotating means (121);

wavelength branching means (101);

a condenser optical system (110); and

reflecting means (111).

It is clear from the "three-prong analysis" (Federal Register/Vol. 65, No. 120, pp. 38510 - 38516; June 21, 2000) that claim 1 indeed invokes 35 USC §112, sixth paragraph with respect to each of the elements recited. In the instant case, Applicants' disclosed input/output means are preferably fiber collimators, and the examiner finds the collimating optical system 104 (Col. 3, line 67) of Lefevre be functionally equivalent, since the system performs the function of "inputting and outputting light" in substantially the same way and produces substantially the same result as Applicants' disclosed means.

> In construing claims drafted in § 112, ¶ 6 form, "[t]he statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim. Nor does the statute permit incorporation of structure from the written description beyond that necessary to perform the claimed function."

Applicants' polarization separating means are disclosed as possibly a polarization separating film or a birefringent walk-off polarizer, and Lefevre clearly illustrates the latter of these. Applicants' disclosed polarization rotating means may comprise a half-wave plate, and one of ordinary skill would understand the "$\lambda/2$ blade" of Lefevre to be a half-wave plate. Applicants' disclosed wavelength branching means may be a transmissive grating, reflective grating or photonic crystal. Lefevre discloses a reflective grating. Applicants' disclosed condenser optical system may be a lens. The examiner regards the lens (110) of Lefevre as performing the same function (see claim 2 of the reference) in substantially the same way to achieve substantially the same results as Applicants' disclosed means, so as to be a *prima facie* functional equivalent therewith. Applicants' disclosed reflecting means may be one or more mirror or an array of MEMS mirrors. Lefevre discloses a dihedron reflector comprising two reflective surfaces and refers to theses as "mirrors". Thus the mirrors of the dihedron perform the same function as recited, in substantially the same way to achieve substantially the same results, so as to be a *prima facie* functional equivalent with Applicants' disclosed reflecting means.

With regard to claim 2, one of ordinary skill would understand the "self-aligned retro-reflecting optical system" of Lefevre as being one in which each wavelength has a component in each of the first and second beams, which components are incident at respective mirrors at the same angle.

With regard to claim 4, Lefevre disclose the polarization direction as being one which is perpendicular to the lines of the grating. It will be appreciated that for the normal grating mount shown, this is the polarization state with the highest wavelength branching efficiency.

Claims 1 – 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Garrett, et al (U.S. Patent number 6,760,511). Referring *for example* to the discussion of Figures 7A- &C, Garrett, et al disclose an optical element comprising

optical input/output means (110) having a plurality of ports (110-1 thru 110-N);

polarization separating means (720);

polarization plane rotating means (730);

wavelength branching means (101);

a condenser optical system (102); and

reflecting means (103).

It is clear from the "three-prong analysis" (Federal Register/Vol. 65, No. 120, pp. 38510 - 38516; June 21, 2000) that claim 1 indeed invokes 35 USC §112, sixth paragraph with respect to each of the elements recited. In the instant case, Applicants' disclosed input/output means are preferably fiber collimators, and the examiner finds the collimators (110-N) of Garrett, et al to be functional equivalent. Applicants' polarization separating means are disclosed as possibly a polarization separating film or a birefringent walk-off polarizer, and Garrett, et al disclose each of these two types (Col. 16, lines 25 – 43). Applicants' disclosed polarization rotating means may comprise a half-wave plate, and Garrett, et al likewise disclose a half-wave plate for this purpose (Col. 16, lines 25 – 43). Applicants' disclosed wavelength branching means may be a transmissive grating, reflective grating or photonic crystal. Garrett, et al disclose a reflective grating. Applicants' disclosed condenser optical system may be a lens. The examiner regards the lens (102) of Garrett, et al as performing the same function in substantially the same way to achieve substantially the same results as Applicants' disclosed means, so as to be a *prima facie* functional equivalent therewith. Applicants' disclosed reflecting means may be one or more mirror or an array of MEMS mirrors. Garrett, et al likewise disclose an array of MEMS mirrors performing the same function, in substantially the same way to achieve substantially the same results, so as to be a *prima facie* functional equivalent with Applicants' disclosed reflecting means.

> In construing claims drafted in § 112, ¶ 6 form, "[t]he statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim. Nor does the statute permit incorporation of structure from the written description beyond that necessary to perform the claimed function."

With regard to claim 2, each wavelength has a component in each of the first and second beams, which components are incident at respective mirrors at the same angle, as shown in Figure 7B, so that a first component of each wavelength retraces the path of the second component at that wavelength, and *vice versa*.

With regard to claim 4, Garrett, et al refer to the polarization direction having the highest polarization branching efficiency as the "preferred polarization direction" (Col. 14, lines 32- 40). The components are rotated to have this preferred polarization direction.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 4 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 7 of U.S. Patent No. 6,825,981. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application recite the details of the patented invention in only broader aspects. Patented claim 7 is shown below with its elements reorganized into an order corresponding with the copending claim 1 and with the claim amendments necessary to make the claims of equivalent scope.

Patented Claim 7 amended to read like pending claim 1

An optical ~~signal processor~~ element comprising:

optical input/output means ~~including~~ having a plurality of ~~input/output~~ ports for inputting or outputting light;

~~the plurality of input/output ports having respective light input/output directions, in parallel with each other, located on a first virtual plane; the optical input/output means inputting light into any of the plurality of input/output ports and outputting the light from any of the other input/output ports;~~

~~a first optical system for collimating the light arriving from any of the plurality of input/output ports, and outputting thus collimated light;~~

~~3. An optical signal processor according to claim 1, wherein the first and second virtual planes are perpendicular to each other.~~

7~~. An optical signal processor according to claim 3, further comprising:~~

polarization separating means ~~disposed between the input/output means and the wavelength branching means; the polarization separating means~~ for receiving light from ~~separating the light fed into~~ any of the plurality of ~~input/output~~ ports , separating the light in terms of polarization into respective polarized light components having first and second directions orthogonal to ~~each other in terms of polarization~~, and outputting a first light beam of the polarized light component having the first direction and a second light beam of the polarized light component having the second direction; and

polarization plane rotating means for ~~disposed between the polarization separating means and the wavelength branching means; the polarization plane rotating means~~ receiving any of the first and second light beams outputted from the polarization separating means, rotating a polarization direction of the received light beam to make the first and second light beams have the same polarization direction

~~yielding the highest wavelength branching efficiency in the wavelength branching means~~, and outputting thus rotated light beam;

~~wherein a line connecting a point where an optical axis of the first light beam fed from the first optical system into the wavelength branching means intersects the wavelength branching means and a point where an optical axis of the second light beam fed from the first optical system into the wavelength branching means intersects the wavelength branching means is parallel to the second virtual plane; and wherein a line connecting a point where an optical axis of the first light beam fed from the first optical system into the wavelength branching means intersects the wavelength branching means and a point where an optical axis of the second light beam fed from the second optical system into the wavelength branching means intersects the wavelength branching means is perpendicular to the second virtual plane.~~

wavelength branching means for receiving the first and second light beams outputted from the polarization separating means and the polarization plane rotating means, ~~light collimated by the first optical system,~~ spatially separating the light in terms of wavelength, and outputting thus obtained wavelength light components, ~~thus outputted wavelength light components having respective optical axes located on a second virtual plane;~~

a condenser ~~second~~ optical system for receiving the wavelength light components outputted from the wavelength branching means after wavelength separation, and converging the thus received wavelength light components; and

reflecting means having ~~including~~ a mirror with a reflecting surface located ~~positioned~~ at a light-converging point of the wavelength light components converged by the condenser ~~second~~ optical system~~; the reflecting means~~ , and causing the light reflected by the mirror to be outputted from any of the plurality of ~~input/output~~ ports by way of the condenser ~~second~~ optical system, wavelength branching means, polarization plane rotating means, and polarization separating means ~~and first optical system; wherein the first and second virtual planes are not parallel to each other; and wherein the light fed into the wavelength branching means after being collimated by~~

~~the first optical system has a greater beam width in a direction parallel to the second virtual plane than in a direction perpendicular to the second virtual plane~~.

Thus, it should be apparent that claim 1 is *broader than* the patented claim by omission of the lined-through text. Although pending claim 1 particularly recites a "condenser" optical system in place of a "second" optical system, the recited functions of the two systems are recited as being the same. Also, although pending claim 1 recites that the reflecting means also causes the light to pass through the polarization rotating means and the polarization separating means, patented claim 7 recites these elements as being disposed between the input/output means and the wavelength branching means. Thus, one of ordinary skill would have appreciated that either the path of light returned from the reflecting means *inherently* passes through these components, or it would have been obvious to pass through these components because of their placement in the system and their function as providing polarization diversity to the optical system. Thus, a structure that infringes the patented claims either inherently infringes the pending claim, or differs from a structure that infringes the pending claims in only an obvious way.

The aspect of wavelength branching efficiency recited in pending claim constitutes part of the lined-through text above. Thus, pending claim 4 is no narrower than the patented claim for the reasons set forth above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Scott, et al (U.S. Patent Appl. Pub. no. 2003/005834A1) disclose an optical element with input/output means, polarization separation means, polarization rotation means, wavelength branching means, a condenser optical system and a reflecting system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 – 5.

The centralized fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for *all* communications.

JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

December 10, 2004